National Institute of Environmental Health Sciences

Potential association of dengue hemorrhagic fever incidence and remote senses land surface temperature, Thailand, 1998

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Abstract:

A pilot study was designed to analyze a potential association between dengue hemorrhagic fever (DHF) incidence and, temperature computed by satellite. DHF is a mosquito transmitted disease, and water vapor and humidity are known to have a positive effect on mosquito life by increasing survival time and shortening the development cycle. Among other available satellite data, Land Surface Temperature (LST) was chosen as an indicator that combined radiated earth temperature and atmospheric water vapor concentration. Monthly DHF incidence was recorded by province during the 1998 epidemic and obtained as a weekly combined report available from the National Ministry of Public Health. Conversely, LST was calculated using remotely sensed data obtained from thermal infrared sensors of NOAA satellites and computed on a provincial scale. Out of nine selected study provinces, five (58.3%) exhibited an LST with a significant positive correlation with rainfall ($p < 0.05$). In four out of nineteen surveyed provinces (21.3%), LST showed a significant positive correlation with DHF incidence ($p < 0.05$). Positive association between LST and DHF incidence was significantly correlated in 75% of the cases during non-epidemic months, while no correlation was found during epidemic months. Non-climatic factors are supposed to be at the origin of this discrepancy between seasonality in climate (LST) and DHF incidence during epidemics.

Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Ecosystem Changes, Meteorological Factors, Precipitation, Temperature

Temperature: Fluctuations

Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

Geographic Location:

resource focuses on specific location

Non-United States

Non-United States: Asia

Asian Region/Country: Other Asian Country

Other Asian Country: Thailand

Health Impact:

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Vectorborne Disease

Vectorborne Disease: Mosquito-borne Disease

Mosquito-borne Disease: Dengue

Resource Type:

format or standard characteristic of resource

Research Article

Timescale:

time period studied

Time Scale Unspecified